



WHITE PINE WEEVIL

Pissodes strobi

Introduction

The white pine weevil (WPW), also known as the Engelmann spruce weevil or Sitka spruce weevil (Figure 1), is a beetle that can cause severe damage to the terminal growth of native and ornamental spruces and certain pines.

White pine weevil occurs throughout northern



Figure 1. White pine weevil adult. (Photo by L. Livingston, Idaho Department of Lands).

North America and is a particular problem in smaller trees, such as those found in forest regeneration, seed orchards, and Christmas tree plantations. In the western United States the principal hosts are spruces (Engelmann, blue and Sitka spruces), while in the Midwest and Northeast, pines are the preferred hosts, especially eastern white pine. Damage is usually confined to the terminal growth or, rarely, upper-side branches, and repeated top-

kill can give the trees a dense, bushy appearance (Figure 2).

White pine weevils usually do not attack trees that are taller than 30 feet. Open-grown trees are preferred, and in certain areas, infestations are so heavy that regeneration with Engelmann spruce may be impractical.



Figure 2. Bushy appearance of blue spruce after WPW attack. (Photo by T. Eckberg, Idaho Department of Lands)

Biology

White pine weevil has one generation per year and overwinters as an adult in leaf litter or other protected places around the base of the host tree. In the spring (April-June), adults emerge to begin feeding on the previous year's terminal growth. Eggs are then laid in these feeding punctures and hatch in approximately 7-10 days. The developing larvae feed underneath the bark and tunnel in the pith, mining the new growth until pupation. Larval feeding girdles the terminal, and by late summer, the new growth wilts, the needles

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Dustin Miller
Director
Idaho Department of Lands
300 N. 6th Street, Suite 103
Boise, ID 83720
Phone: (208) 334-0200

Archie Gray
Chief
Forestry Assistance Bureau
3284 W. Industrial Loop
Coeur d'Alene, ID 83815
Phone: (208) 769-1525

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turn red and eventually drop. The pupal stage takes place in a chamber lined with excelsior-like frass called a “chip cocoon” (Figure 3).



Figure 3. Larvae and pupal chambers (note “chip cocoons”). Photo by T. Eckberg, Idaho Department of Lands.

The chip cocoon is located under the bark, partly inside the sapwood and is a distinguishing feature of WPW infestations. Adults emerge in late summer or early fall, and may feed on needles or buds before seeking sheltered places to overwinter.

Insect Recognition

White pine weevil is one of approximately 20 species of closely related weevils in the genus *Pissodes*. A closely related species, *P. terminalis*, attacks lodgepole pine in the northern Rockies.



Figure 4. Adult white pine weevils on blue spruce. Photo by T. Eckberg, Idaho Department of Lands.

WPW adults are mottled brown-and-white beetles with elongated, downward pointing mouthparts (Figure 4).

Larvae are legless white grubs approximately 10 mm long, with brown head capsules and are very similar in appearance to bark beetle larvae (Figure 3). The presence of a chip cocoon (with or without pupae inside) in the terminals of spruce or white



Figure 5. Cream colored pupae inside chip cocoon. Photo by S. Munson USFS www.forestryimages.org.

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Figure 6. Pitch flow associated with feeding punctures and egg laying activity. Photo by T. Eckberg, Idaho Department of Lands.

pine is diagnostic and will confirm the identification. Pupae are cream colored and resemble adults (Figure 5).

Damage is typically confined to the terminal leader or larger lateral leaders in the upper crown. Feeding punctures early in the season will often ooze sap, and this is an early indicator of infestation (Figure 6).

Another characteristic of attack is the wilting of the current year's terminal growth, which may resemble a "shepherd's crook" (Figure 7). Larval feeding usually kills the last two year's growth.

As these infested leaders die, healthy lateral branches assume apical dominance. Infested trees are rarely killed outright, but may have such poor form that they are unsuitable for reforestation or landscape use (Figure 8). The dead tops can persist for several years and can become an entry point for decay fungi. Chip cocoons can remain on the tree for several years and are good indicators of previous attack.

Management

Control of this pest is difficult, especially in areas with a history of infestations. Since WPW prefers open-grown trees, close spacing and replanting in small blocks that limit available light can reduce weevil damage. In the eastern United



Figure 7. Killed terminal with "shepherd's crook" form. Photo by W. Cranshaw CSU www.forestryimages.org.

States, replanting eastern white pine at high stocking levels (800-1200 trees per acre) has been effective at reducing WPW damage. In tree farms or Christmas tree plantations, chemical control may be possible using products labeled for control of bark beetles. Applications should be applied prior to adult emergence and egg-laying (spring). In northern Idaho, the first dry weekend in April is a good rule of thumb.



Figure 8. Codominant stems on blue spruce after WPW attack. Photo by W. Cranshaw Colorado State University www.forestryimages.org

Pruning and destroying infested terminals (at first

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sign of wilting) should also provide some control. The most successful approach would be a combination of terminal pruning and pesticide application.

Always consult the product label before using any pesticide.

Useful links:

[Forest Insect and Disease Leaflet](#)

[USFS Region 1 Field Guide](#)

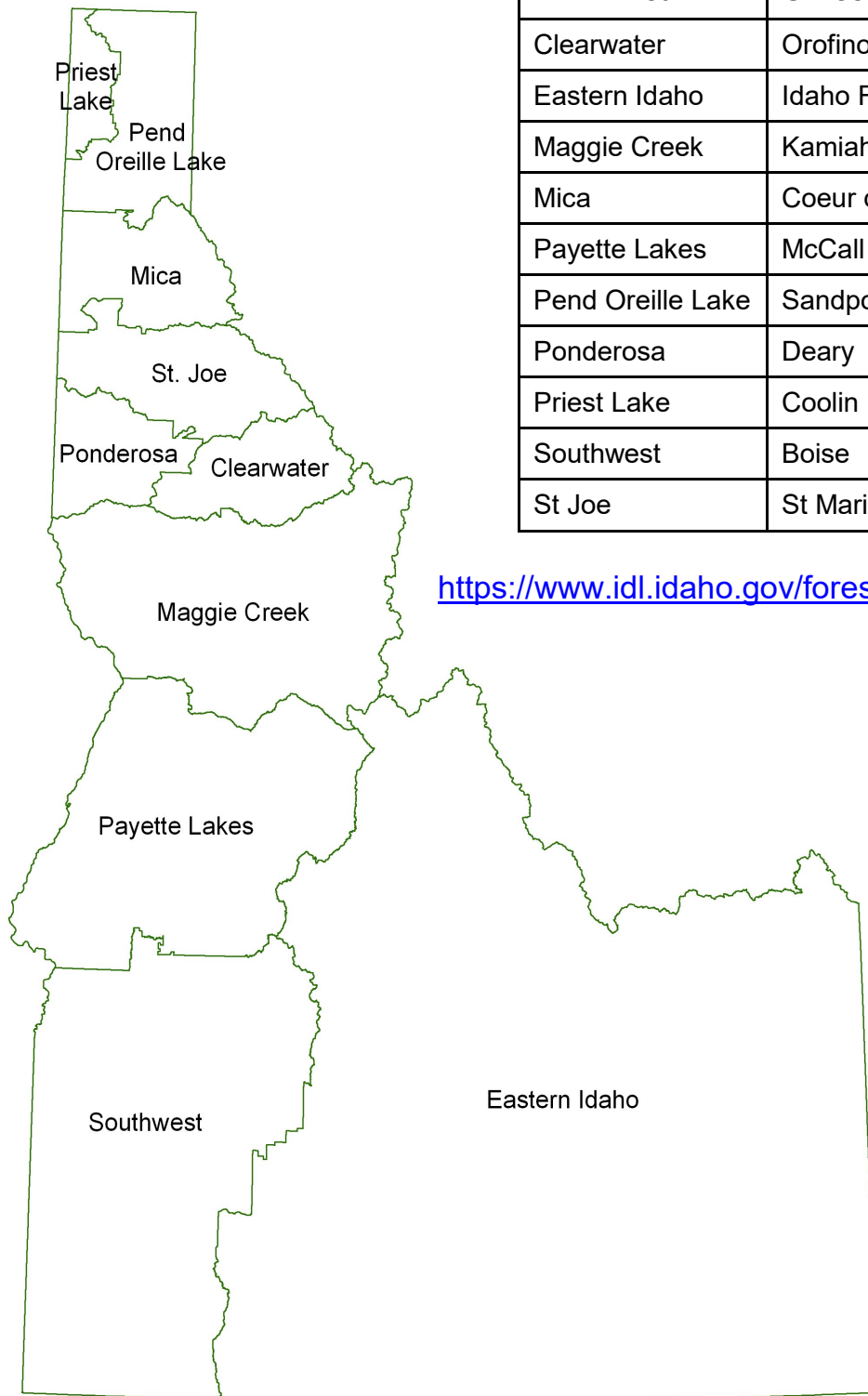
[USFS Region 1 Management Guide](#)

Prepared by:

Tom Eckberg
Forest Health Program Manager
Idaho Department of Lands
3284 W. Industrial Loop
Coeur d'Alene, ID 83815
(208) 666-8668
teckberg@idl.idaho.gov



**FOR MORE INFORMATION CONTACT
ANY IDAHO DEPARTMENT OF LANDS
PRIVATE FORESTRY SPECIALIST**



Area	Office Location	Phone
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